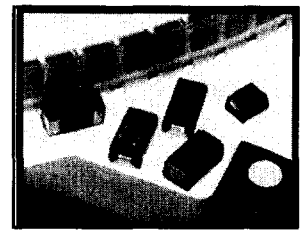
Surface Mount Polymer-Tantalum Capacitor

NTP Series

FEATURES

- Ultra Low ESR and High Ripple Current Ratings
- Values from 2.2µF to 470µF
- Suitable for Reflow Soldering
- Available in EIA J, P, A2, A, B2, B, C, V and D Case Sizes

Low ESR Component
Polymer Cathode Tantalum
For Performance Data
See www.LowESR.com



CHARACTERISTICS

Capacitance Range	2.2µF to 470µF	
Capacitance Tolerance	±20% (M)	
Rated Working Voltage	4.0Vdc to 10Vdc*	
Operating Temperature Range	-55°C ~ +105°C (derating above 85°C)	
Dissipation Factor (120Hz/20°C)	See specifications table	
Leakage Current Rating (after 5 minutes)	0.1CV or 3µA whichever is greater	
Capacitance Change Verse Temperature	-55°C	+105°C
	ΔC - 20%	ΔC + 50%
Soldering Heat Resistance (+240°C for 5 ~ 10 sec.)	ΔCapacitance: ± 20% Leakage Current: 130% of initial value Dissipation Factor: less than value in specifications table.	
Moisture Resistance (500 hours; 90~95% RH @40°C)	ΔCapacitance: + 30% ~ -20% Leakage Current: less than value in specifications table. Dissipation Factor: less than value in specifications table.	
Load Life Test (rated voltage @ 85°C) 1000 hours	ΔCapacitance: ± 30% Leakage Current: less than value in specifications table. Dissipation Factor: 150% of value in specifications table.	
Base Failure Rate	1%/1000 hours at +85°C	

* It is recommended that the applied voltage be less than 80% of the rated voltage

CASE SIZES AND MAXIMUM DISSIPATION FACTOR

Rated Voltage @ +85 °C		4	6.3	10
Surge Voltage @ +85 °C		5.2	8	13
Derated Voltage @ 105°C		3.3	5	8
Capacitance µF	Code	Case Sizes	Case Sizes	Case Sizes
2.2	225	-	J (4%)	-
3.3	335	-	J (4%) P (6%)	A (6%)
4.7	475	-	J (4%) P (6%)	A2/A (6%)
6.8	685	-	P/A (6%)	A (6%) B (8%)
10	106	P/A (6%)	P/A2/A (6%)	A (6%) B (8%)
15	156	-	A (6%) B (8%)	B (8%) C (9%)
22	226	B (8%)	A (6%) B2 (10%) B (8%)	B (8%) C (9%)
33	336	A (6%)	B2 (10%) B (8%)	B (8%) C (9%)
47	476	A (6%) B2 (10%)	B (8%) C (9%)	C (9%) V/D (10%)
68	686	C (9%)	B (8%) C (9%)	V/D (10%)
100	107	B (8%)	B (8%) C (9%)	V/D (10%)
150	157	C (9%)	C (9%) V/D (10%)	D (10%)
220	227	C (9%) V/D (10%)	D (10%)	D (10%)
330	337	D (10%)	D (10%)	-
470	477	D (10%)	-	-

PART NUMBERING SYSTEM

NTP 106 M 16 TR B(60) F

- F — Lead Free (100% Sn)
- B(60) — ESR
- TR — Case Code
- Packaging: TR=Tape/Reel
- 16 — Voltage
- M — Tolerance Code
- 106 — Capacitance Code
- NTP — Series

SURFACE MOUNT

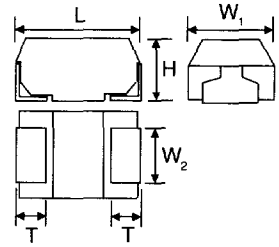
Surface Mount Polymer-Tantalum Capacitor

NTP Series

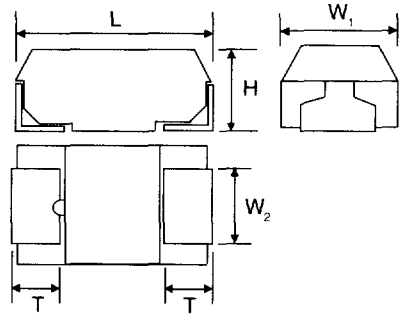
MAX. ESR (mΩ) @ 20°C/100KHz
RIPPLE CURRENT (mArms) @20°C 1MHz/100KHz

Capacitance (µF)	Working Voltage (Vdc)		
	4	6.3	10
2.2	-	J(600)=129/96	-
3.3	-	J(600)=129/96 P(500)=224/168	A(800)=652/489
4.7	-	J(600)=129/96 P(500)=224/168	A2(500)=346/259 A(800)=306/229
6.8	-	P(500)=224/168 A(800)=306/229	A(800)=306/229 B(500)=412/309
10	P(500)=224/168 A(500)=387/290	P(500)=224/168 A2(500)=346/259 A(500)=387/290	A(300)=500/375 B(300)=532/399
15	-	A(500)=387/290 B(300)=532/399	B(300)=532/399 C(200)=742/556
22	B(300)=532/399	A(500)=387/290 B2(80)=968/726 B(300)=532/399	B(300)=532/399 C(150)=856/642
33	A(500)=387/290	B2(80)=968/726 B(300)=532/399	B(200)=652/489 C(100)=1049/786
47	A(200)=612/459 B2(80)=968/726	B(200)=652/489 B(70)=1102/826 C(100)=1049/786	C(100)=1049/786 V(60)=1443/1082 D(100)=1225/918
68	C(100)=1049/786	B(200)=652/489 B(70)=1102/826 C(100)=1049/786	V(60)=1443/1082 D(100)=1225/918
100	B(70)=1031/773 B(45)=1374/1030	B(70)=1102/826 B(45)=1374/1030 C(100)=1049/786	V(45)=1667/1250 D(55)=1651/1238
150	C(100)=1049/786	C(100)=1049/786 C(55)=1414/1060 V(45)=1667/1250 D(55)=1651/1238 D(40)=1936/1452 D(25)=2449/1836	D(55)=1651/1238 D(40)=1936/1452
220	C(55)=1414/1060 V(45)=1667/1250 V(25)=2336/1752 D(55)=1651/1238 D(40)=1936/1452 D(25)=2449/1836	D(55)=1651/1238 D(40)=1936/1452	D(40)=1936/1452 D(25)=2449/1836
330	D(40)=1936/1452 D(25)=2449/1836 D(15)=3162/2370	D(40)=1936/1452 D(25)=2449/1836	-
470	D(25)=2449/1836 D(18)=2887/2165	-	-

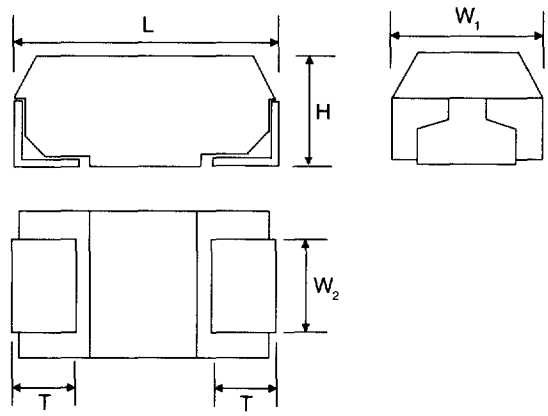
"J, P, A2, A" Case Size



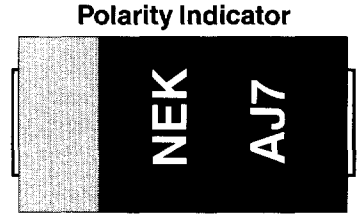
"B2, B" Case Size



"C , V & D" Case Size



Polarity Indicator



Silver Band Denotes Anode Termination

RIPPLE CURRENT TEMPERATURE DERATING

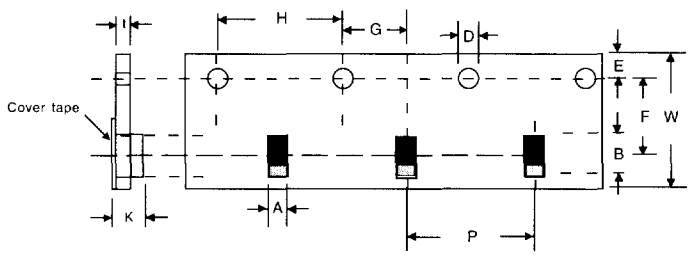
20°C	85°C	105°C
1.0	0.9	0.6

CASE DIMENSIONS (mm)

Case Size	EIA Code	L	H	W_1	W_2	T
J	0603	1.6 ± 0.1	0.8 ± 0.1	0.8 ± 0.1	0.8 ± 0.1	0.3 ± 0.15
P	2012	2.0 ± 0.2	1.1 ± 0.1	1.25 ± 0.2	0.9 ± 0.1	0.5 ± 0.1
A2	3216L	3.2 ± 0.2	1.1 ± 0.1	1.6 ± 0.2	1.2± 0.1	0.8 ± 0.3
A	3216	3.2 ± 0.2	1.6 ± 0.2	1.6 ± 0.2	1.2± 0.1	0.8 ± 0.3
B2	3528L	3.5± 0.2	1.1 ± 0.1	2.8 ± 0.2	2.2 ± 0.1	0.8 ± 0.3
B	3528	3.5± 0.2	1.9 ± 0.2	2.8 ± 0.2	2.3 ± 0.1	0.8 ± 0.3
C	6032	6.0 ± 0.2	2.5 ± 0.3	3.2± 0.2	1.8 ± 0.1	1.3 ± 0.3
V	7343	7.3 ± 0.2	1.9 ± 0.1	4.3 ± 0.2	2.4 ± 0.1	1.3 ± 0.3
D	7343	7.3 ± 0.2	2.8 ± 0.2	4.3 ± 0.2	2.4 ± 0.1	1.3 ± 0.3

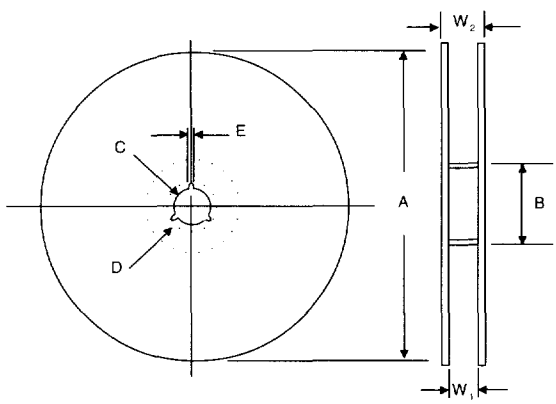
TAPE SPECIFICATIONS (mm)

Case Size	A ±0.2	B ±0.2	C ±0.3	D ±0.1	E ±0.1	F ±0.1	G ±0.05	H ±0.1	J +0.1	K ±0.2	t max.	Reel Qty
J	1.0	1.8	8.0	3.5	1.75	4.0	2.0	4.0	ϕ 1.5	1.1	0.2	4000
P	1.4	2.2								1.4		3000
A2	1.9	3.5								1.4		3000
A	1.9									1.9		2000
B2	3.2	3.8								1.4		3000
B	3.3									2.1		2000
C	3.7	6.4	12.0	5.5		8.0				3.0	0.3	500
V	4.8	7.7								2.1	0.4	1000
D	4.8	7.7								3.3	0.3	500



REEL SPECIFICATIONS (mm)

Tape Width	A ± 2.0	B min.	C ± 0.5	D ± 0.5	E ± 0.5	W_1 ± 1.0	W_2 max.
8 mm	ϕ 178	ϕ 50	ϕ 13	ϕ 21	2.0	10	14.5
12 mm						14.5	18.5



RECOMMENDED PEAK TEMPERATURE/TIME

Maximum Time	Peak Soldering Temperature
5 Seconds	250°C
10 Seconds	240°C
20 Seconds	230°C

RECOMMENDED LAND PATTERN (mm)

Case Size	S max.	X min.	Y min.
A	1.1	3.8	1.5
B	1.4	4.1	2.7
C	2.9	6.9	2.7
D	4.1	8.2	2.9